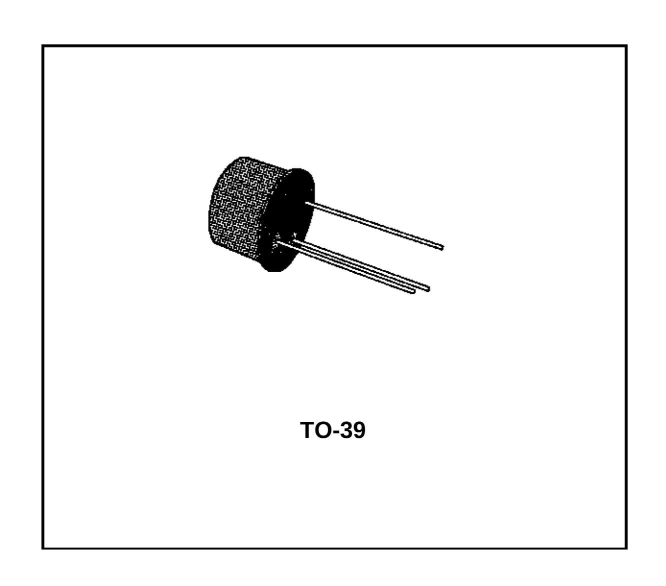
SGS-THOMSON MICROELECTRONICS

BC140
BC141

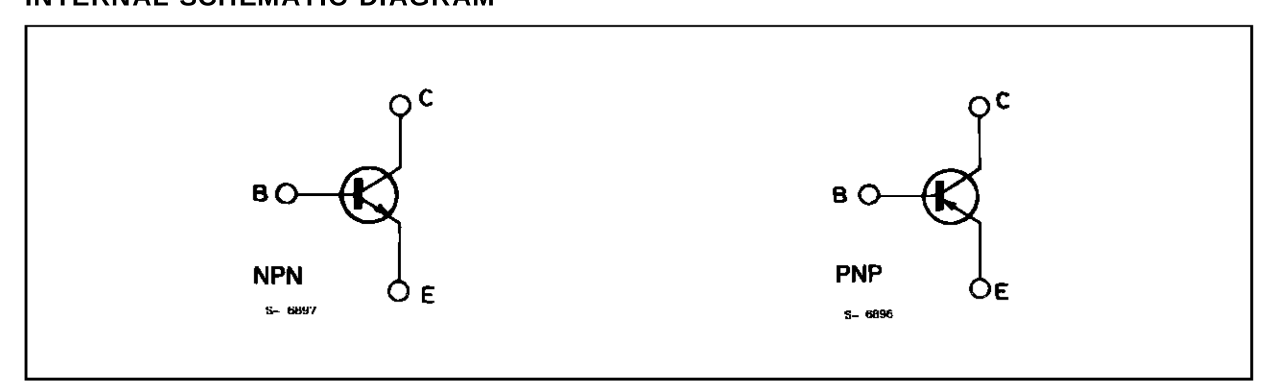
GENERAL PURPOSE TRANSISTORS

DESCRIPTION

The BC140 and BC141 are silicon planar epitaxial NPN transistors in TO-39 metal case. They are particularly designed for audio amplifiers and switching applications up to 1 A. The complementary PNP types are the BC160 and BC161.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BC140	BC141	
V_{CBO}	Collector-base Voltage ($I_E = 0$)	80	100	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	40	60	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	7		V
I_C	Collector Current	1		A
I_B	Base Current	0.1		A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 45$ °C at $T_{case} \leq 45$ °C	0.65 3.7		W W
T_{stg}	Storage Temperature	– 55 to 175		°C
T_j	Junction Temperature	175		°C

THERMAL DATA

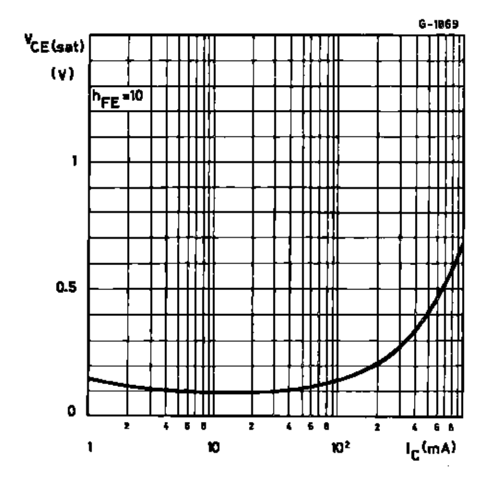
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	35	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	200	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

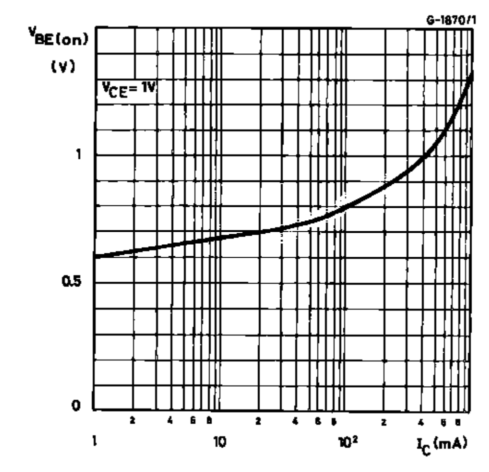
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current (I_E = 0)	V_{CES} = 60 V V_{CES} = 60 V T_{amb} = 150 °C			100 100	nA μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 100 μA for **BC140** for **BC141**	 80 100			 V V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = 30 mA for **BC140** for **BC141**	 40 60			 V V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 100 μA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 100 mA I_B = 10 mA I_C = 500 mA I_B = 50 mA I_C = 1 A I_B = 0.1 A		0.1 0.35 0.6	 1	V V V
V_{BE}*	Base-emitter Voltage	I_C = 1 A V_{CE} = 1 V		1.25	1.8	V
h_{FE}*	DC Current Gain	I_C = 100 μA V_{CE} = 1 V for **BC140-141** for **BC140-141** Gr. 6 for **BC140-141** Gr. 10 for **BC140-141** Gr. 16 I_C = 100 mA V_{CE} = 1 V for **BC140-141** for **BC140-141** Gr. 6 for **BC140-141** Gr.10 for **BC140-141** Gr.16 I_C = 1 A V_{CE} = 1 V for **BC140-141** for **BC140-141** Gr. 6 for **BC140-141** Gr.10 for **BC140-141** Gr.16	 40 40 63 100	 75 28 40 90 140 63 100 160 26 15 20 30	 250 100 160 250	
f_T	Transition Frequency	I_C = 50 mA V_{CE} = 10 V	50			MHz
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz		12	25	pF
t_{on}	Turn-on Time	I_C = 100 mA I_{B1} = 5 mA			250	ns
t_{off}	Turn-off Time	I_C = 100 mA I_{B1} = I_{B2} = 5 mA			850	ns

* Pused : pulse duration = 300 μs, duty cycle = 1 %.

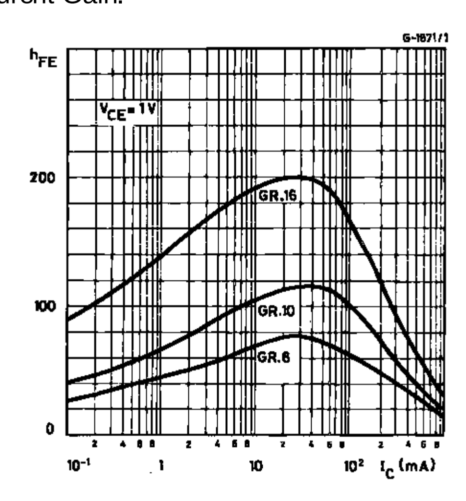
Collector-emitter Saturation Voltage.



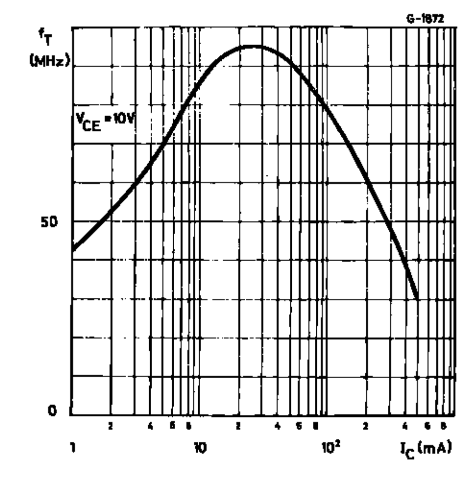
Base-emitter Voltage.



DC Curent Gain.

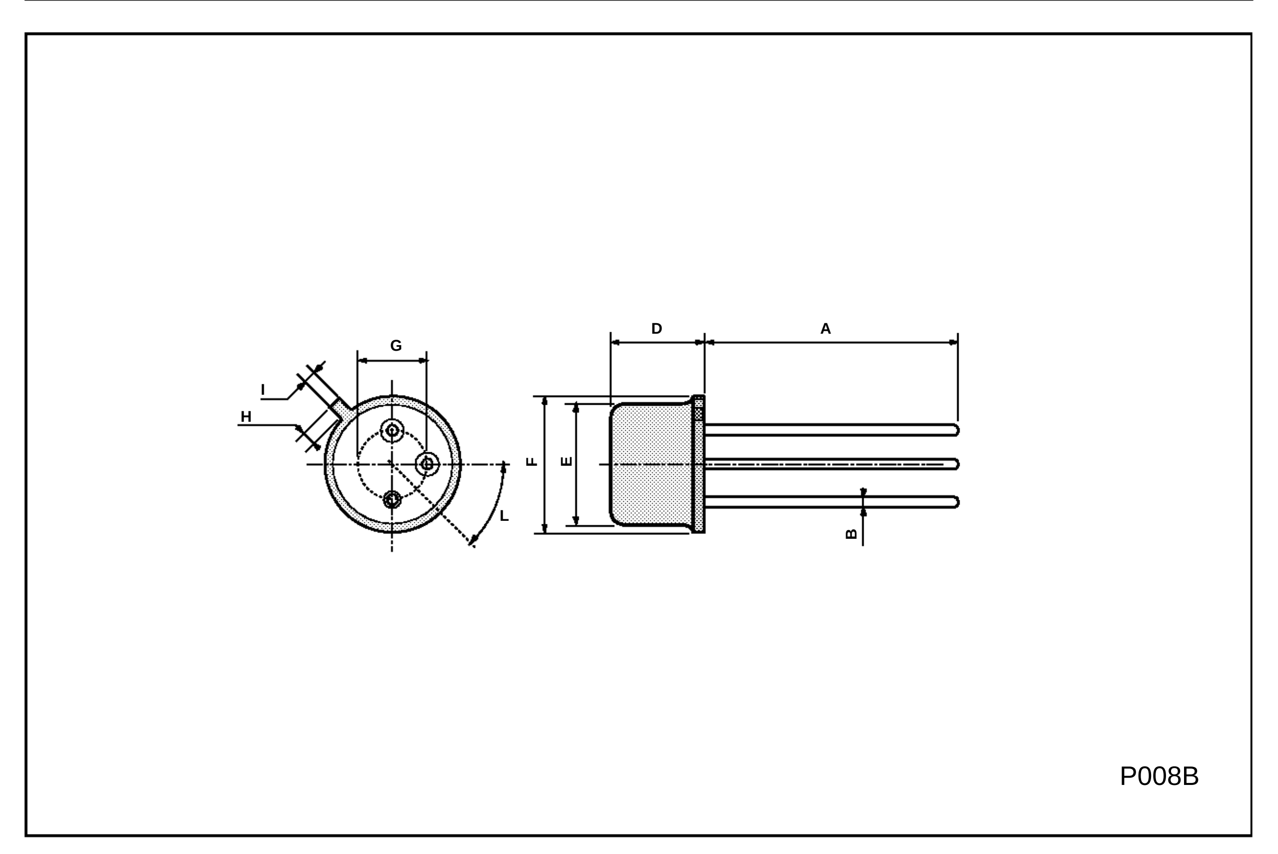


Transiition Frequency.



TO39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45^{o} (typ.)					



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